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This situation leaves several questions that should be clearly resolved in a recirculated Draft EIR: How many miles of tunneling will a Pacheco alignment require and precisely where will tunneling occur? Are costs for this tunneling actually $885 million (as in Corridor Evaluation, Appendix E)? Is $885 million for 5 miles, 10 miles, 12 miles, or 12.3 miles of tunneling? What alternative construction techniques (elevated structures?) will be needed to mitigate the "most impacts" for the "as little as 5 miles" tunneling option? Is the 5-mile tunneling option realistic given admittedly greater impacts on natural resources? What mitigation costs will greater natural resource impacts entail?

Another example of unclear and unstable project description concerns ridership modeling. For instance, Diablo alignments were added after completion of the two major ridership studies in 1996 and 2000 and the ridership runs prepared in 1999 for the 2000 Business Plan. As a result, the DEIR/S does not include Diablo alignment ridership data (apparently, unpublished runs were performed for HSRA in early 2003) and therefore fails to provide information necessary to meaningfully compare alternatives. For instance, two sheets of data from the unpublished Diablo runs obtained by PCL suggest that the number of passengers boarding and alighting in Merced under the Diablo alignment would be 46% less than under the Pacheco alignment. This kind of basic information, replicated for each station and alignment, would be of great interest to communities throughout the state, but is unavailable in this DEIR/S.

Aside from describing how the system will operate, the ridership modeling underpins the DEIR/S's air quality and cost benefit analysis. These analyses in the DEIR/S are based only on one Pacheco alignment scenario. Our attachment on ridership modeling discusses in more detail how these analyses could in fact differ based on alignment.

Presentation of Oakland and San Jose ridership data in background materials provides another indication of a changing project with unequal analyses. While the DEIR/S emphasizes travel times between Sacramento and San Jose, background materials generally omit station alighting and boarding (and related) data for San Jose and Oakland, presumably because service and alignment plans to reach these cities changed over the period during which the project was planned. For the Business Plan version of the Pacheco alignment, some of this data can be inferred from the parking analysis. This is not the standard of transparency HSRA should present for a $36 billion project that is already on the statewide ballot. Thorough and comparable data should be available for each destination along each alignment for each phase of the project, which is not currently the case.

A third example of the way in which changing project descriptions have yielded uneven analysis concerns Dumbarton Bridge cost estimates. Between earlier and recent cost estimates, Dumbarton bridge costs escalated from around $300 million (counting mitigation) to over $1 billion for construction plus $1 billion in mitigation. This 700% increase reflected changed methodology in estimating the cost of the bridge, and separately, the mitigation. As mentioned above, for every segment of the project statewide except the Dumbarton Bridge, mitigation is assumed to be 3% of construction

costs. This inconsistent treatment of the bridge and related mitigation render the information meaningless for comparative purposes.[12]

Consistent and complete information about all project alternatives must be included in a revised DEIR/S. Such information must include, but not be limited to all information necessary to analyze and compare project alternatives, develop feasible mitigation measures and other alternatives as warranted.

Incomplete Project Description

Meaningful Bay Area alignment comparisons are also frustrated by incomplete information about the whole project, including project phasing and related projects.

As mentioned in the main body of our comments, the DEIR/S fails to mention Caltrain Baby Bullet service, the advent of which has been announced in the press at least since 2000, and which has been the subject of high-profile state legislation during the period when the HST project has been studied. Nor are the Caltrain Baby bullets included in the ridership study (this omission alone should require a revised/re-circulated DEIR/S). To the degree that San Jose-San Francisco HSR service duplicates Baby Bullet service, it will be beneficial to both projects for HSR to take an alternative alignment. HSRA should take every opportunity to explore coordinated service that maximizes ridership for each service and for both taken together. This analysis is likely to find significant differences between Pacheco/Diablo and Altamont alignments. Similarly, the ridership model and service plan analyses should explain coordination and impacts related to other Caltrain, BART, AC Transit, Sacramento RT, and other transit systems.

The DEIR/S also omits fundamental engineering aspects of the proposed project, which are needed to adequately compare alignments. Examples include: 1) the need for and provisions for wildlife crossings over or under fencing 2) extent of geologic work such as borings and related roads, staging areas;[13] and 3) construction activities, including staging, onsite structures and activities in remote areas, access and emergency provisions for heavy machinery and personnel; (4) likely mitigation measures, which could either result in indirect impacts or reduce project related impacts including, but not limited to undergrounding, aerial structures to allow animal passage, tunneling to avoid surface impacts, among others need to be identified, and their costs factored into the comparison of alternatives.

Also, the DEIR/S lacks a clear description of Bay Area-Merced stations. The DIER/S's parking analysis begins to give a picture of daily station operations at some stations, assumed to be along the Pacheco alignment. A thorough comparison of station

[12] Furthermore, the bridge description is inadequate. Costs are based on a different, non-comparable bridge, and no study is presented of the particular Dumbarton bridge.
[13] The January 2004 Tunneling Issues Report notes that "Considerable geologic exploration is required prior to construction," suggesting that (a) such exploration could entail environmental impacts and (b) exploration could result in findings that inform the decision of which alignment to build through. Since this level of geologic exploration has not been done, it should be performed on all feasible alignments, including Altamont, prior to choosing an alignment.

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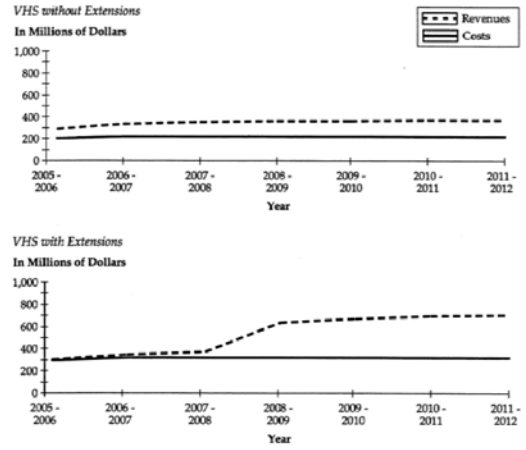
footprints, modal passenger access patterns, structures, traffic impacts at the station and on surrounding areas, parking requirements (with and without planned mitigation) is needed *in advance* of choosing an alignment. It is particularly important for this analysis to clearly present Phase I alignment opportunities separately from Phase II or the full system, so that communities are aware of what is feasible in the foreseeable future.

The DEIR/S lacks an adequate description of the economic feasibility of the various Bay Area-to-Merced HSR alternatives. As suggested by comments above on station and tunneling issues, a clear description of the costs of the HSR alternatives and the feasibility of funding route acquisition and improvement must be disclosed. Particularly, this information must assess the economic viability of different alignments for Phase I of the project.

As suggested above, omission of project phasing information is a major failing of this DEIR/S (more on this below). Ridership and environmental studies performed by the predecessor Intercity High Speed Rail Commission through 1996 separately explained two major phases of this project. The first phase of the project is the portion from LA to the Bay Area, which would be separately financed partially through an initial statewide bond measure. The second phase includes "extensions" to Sacramento, San Diego, and possible Oakland that presumably would depend in part upon the financial success of the first phase of the project.
The graph below, borrowed from IHSRC's 1996 Summary Report and Action Plan, suggests the kind of understanding that can be gleaned from analyzing each phase of the project:

Figure 5.2 Operating Revenue and Costs



(page 5-11 SRAP)

This chart suggests that the Phase I along an Altamont alignment (favored at the time this document was prepared) will be financially self-sufficient, and furthermore that added extensions will increase revenue much more than operating costs. Apparently, the record does not include similar charts for other alignments. This is the kind of exploration of financial feasibility for each Phase that could be essential to choosing an alignment and to informing the public generally about the project.

Consistent and Current Ridership Studies

In CEQA/NEPA terms, ridership modeling contains aspects of project description and project setting, each of which must be adequately presented in order to allow informed alignment decisions. Unfortunately, DEIR/S modeling falls well short of this requirement.

While Attachment B to our main letter provides more in depth comments regarding ridership modeling in the DEIR, particularly as it applies to the elimination of the

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Altamont alternative, the modeling suffers from the following inconsistencies and inadequacies with respect Bay Area alignments:

- It is inconsistent across the Altamont, Diablo, and Pacheco alignments (and Diablo ridership data are unavailable in the record).
- It does not incorporate access to stations other than highway access. Yet other portions of the DEIR assert that, for the largest station on the system (San Francisco), major shares of passenger access will be through non-highway means. Service to and use of this and other Bay Area stations will be strongly affected by alignment.
- Modeling runs are skewed against an Altamont alignment due to an unsupportable and arbitrary assumption that 50% of trains will go to San Francisco and 50% to San Jose, rather than seeking the proper split to maximize overall ridership. The Authority's consultant that prepared the main ridership studies readily acknowledges the importance of this assumption in determining results:

  "The reason ridership and revenue on the Altamont Pass alternatives is somewhat lower than the Pacheco Pass alternatives is because of the split at Newark causes the frequency of service to be cut in half to all areas west and south of the Bay. This is the same reason why Pacheco Pass alternatives are more attractive to intercity riders than the Altamont Pass alternatives, namely they have the same trains operating at thesame frequencies serving both San Jose and San Francisco.
  (Ridership and Revenue Analysis for High Speed Ground Transportation in California Task 6 Report: Charles Rivers Associates, June 1999,Page 22)
- The DEIR does not consistently display essential, basic ridership data for each alignment, including ridership at each station, station mode access data, origin/destination pairs, travel times between stations. These data and related revenue data must be separately displayed on each alignment for Phase I and Phase II of the project.
- Ridership modeling should explore and clearly display various alternatives for serving Oakland through BART or other connecting service.
- Assumptions underlying ridership modeling must be updated so that auto, air, and rail data stem from the same period and represent the latest available data. Admitted strong travel demand growth in the Bay Area and Sacramento suggest that this could affect alignment decisions.
- Related cost-benefit and air quality analyses must be re-calculated based on the corrected approach suggested above, and should be presented for each alignment.
- In order to maximize cost-benefit and air quality benefits, the DEIR should explore different pricing options and display resulting data for each alignment in Phase I of the project and for the project overall.

Elements of an Adequate Analysis of an Altamont Alternative for Inclusion in a Revised DEIR/S

We have suggested numerous legal inadequacies in the DEIR/S based on the elimination of an Altamont alignment prior to the DEIR/S process and on methodological omissions and inconsistencies. Below, we provide one suggested roadmap to begin to cure these deficiencies:

At a minimum, an analysis of an Altamont Alternative or Alternatives should include the following elements:

- An Altamont crossing with stations initially at least at Freemont and Tracy.
- Realistic mitigations and cost estimates for environmental effects of Altamont, Pacheco, and Diablo. Impacts should include, but not be limited to noise, wilderness, habitat fragmentation and wildlife corridor impairment, construction, hydrology, growth inducement and cumulative impacts.
- Altamont, Pacheco, and Diablo should be thoroughly compared using the same planning and transportation metrics (such as the number of boardings at each station, ridership on each route by origin/destination pair, new riders generated per dollar invested, etc). The modeling should include a mix of express and local service to maximize ridership consistent with the primary goal of serving long distance travelers. Since air quality and cost-benefits analysis are presented as major justifications for the project, modeling should explore the affect of different alignments, stations and operational plans on air quality and cost benefit.
- Comparative analysis shall include land use and smart growth considerations, including effective proposals to ensure that land use/smart growth goals are met, rather than simply suggested as desirable to local jurisdictions.
- San Francisco and San Jose would be served with service design and schedules being allocated between the two cities to maximize ridership.
- San Jose International Airport service should be considered in a Phase I Altamont alignment alternative.
- Ridership should be modeled to include connectivity with BART in the E Bay at least Freemont to serve Oakland. (Pleasanton could be phased in).
- A careful marine survey should determine the most appropriate type/size of Dumbarton bridge crossing. One option should include accommodating future Dumbarton commute service in a way (for instance, express bus service) that requires only 2 tracks on thebridge for rail service.
- The entire Caltrain line should be upgraded regardless of alignment choice.
- The study should consider a phased roll-out of the initial $9 billion bond showing potential benefits of initial segments in case funding runs short.
- The study should be subject to review during development by a policy advisory committee, including environmental, regional transportation planning and state government representatives (including northern central valley representation). It should also be informed by a technical committee of affected transit agencies and local governments. In any EIR of this type,

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significant details often vary after the study starts, so the advisory committee is absolutely important to allow input as new issues arise.

Because HSRA officially ceased pursuing an Altamont alignment option by at least mid-1999 and probably as early as late 1998, many questions were left unanswered in the 1999 Corridor Evaluation that should be answered in a new EIR. The course of study outlined above, combined with close public oversight and involvement, will begin to answer these questions, potentially greatly improving the High Speed Rail project.

ATTACHMENT B

DEIR RIDERSHIP MODELING: ITS INADEQUACIES FOR ALIGNMENT DECISIONMAKING, FINANCIAL AND ENVIRONMENTAL ANALYSIS

While this attachment concentrates on the inadequacy of DEIR/S modeling to justify decisions on a Northern Mountain Crossing alignment, any new modeling on that portion of the project (involving several of the highest-passenger-volume stations) will affect ridership and related analyses for the whole project. A new, thorough comparison with updated travel market data, new coding of station access modes, and exploration of coordinated service options and alternative cost-benefit and air quality options is needed in order to show what tradeoffs will be made in Bay-Area-to-Merced alignment decisions and in decisions about the overall project.

According to the DEIR/S, the first of ten "Key criteria" for evaluating HSR alignments is "maximize ridership and revenue potential by serving key population centers." (DEIR/S page S-2). However, there is no single document that compares the full array of basic, necessary ridership data based on equivalent assumptions between each DEIR/S alignment.[1] Furthermore, there is no similar data presentation comparing DEIR alignments and major alignments that were eliminated before the DEIR/S (indeed, it is not clear what ridership modeling output data exist for the Diablo alignments or how this alignment was incorporated into the model several years after Pacheco and Altamont modeling was performed).

Two major ridership studies were performed by Charles Rivers and Associates to assess the viability of HSR service along different alignments. The first "Independent Ridership and Passenger Revenue Projections for High Speed Rail Alternatives in California" was completed in 1996 and underpinned the California Intercity High Speed Rail Commission's (CIHSRC's) finding that the Altamont Pass alternative produced the strongest ridership and revenue. It estimated ridership on an Altamont alignment to San Francisco, with a "spur" to San Jose, at 22.031 million riders per year in 2015. This study determined that a Pacheco alignment would carry 19.940 million riders per year. Pacheco would carry fewer riders primarily because "…it does not provide service to the upper Valley cities of Modesto and Stockton." (pp. 6-43 through 6-45).

While the authority apparently rejected the service plan implied in this 1996 Altamont "spur to San Jose" run (splitting individual trains at Newark),[2] it is interesting to note that

[1] By contrast with the DEIR/S's scattered analysis of ridership, the Intercity High Speed Rail Commission's "1996 Summary Report and Action Plan" devotes a consolidated chapter to "Ridership and Revenue." Several charts display ridership and revenue figures for different alignments under Phase I of the project and "with extensions" to Sacramento and San Diego. This type of clear presentation, with detailed background information also available, would greatly enhance the DEIR/S.

[2] As mentioned by Loma Prieta Sierra Club, the DEIR/S's rejection of trainsplitting should be re-evaluated in light of other high speed rail services that use this option.

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an Altamont alignment was projected to increase ridership by more than 2 million people above the Pacheco runs, apparently even accounting for delays to all mainline passengers caused by the time needed to split trains at Newark. These modeling runs predicted almost 1 million more riders over Altamont than the Pacheco Pass runs featured in the Corridor Evaluation (22.031 million vs. 21.10 million), despite the fact that the later Pacheco runs included updated travel data reflecting an increased projected travel market. Even a "base" Altamont alignment using 1996 data with no service to San Jose showed greater ridership (21.206 million, page 6-44) than the Pacheco pass alignment serving San Jose and San Francisco that was carried forward in the DEIR/S.

The 1996 study displayed some essential data needed to assess different routes, which HSRA should have requested and displayed for all routes considered in this and later studies. It showed the number of people getting on and off at each station and the number of riders to and from each origin/destination pair for a "base alignment." It revealed ridership on Phase I of the system, separately from the projected system ridership at full build-out. However, it did not provide station alighting and O/D pairs for the fully built-out project. This means, for instance, that we do not have access to data showing how many people would get on and off at each station under an Altamont Pass alignment when the full system is built-out. Scrutiny of these data is essential to make clear why overall ridership figures change under different alignments (more on that below). Unfortunately, no study, including the second major ridership study, which was performed for CIHSRC's successor agency, the High Speed Rail Authority, has provided them.

The second major study is "Independent Ridership and Passenger Revenue Projections for High Speed Rail Alternatives in California, January 2000." One major purpose of this study was to update some of the air, auto, and rail travel market data used to project how many people might wish to ride an HSR system in 2020. Since travel projections had increased significantly from the 1996 study, HSR trips modeled in the January 2000 study rose significantly. However, this study included only Pacheco Pass alignments. Thus, it found that Pacheco could carry 30.3 million riders in 2020, or 32.0 million riders, depending on the length of the southern California alignment (page 59). Interestingly, these ridership figures are not cited in the DEIR alignment discussion. Possibly, comparable data are not available for the Altamont, Pacheco, and Diablo routes because the January 2000 study included only Pacheco alignments.

Also, certain ridership data were updated for the 2000 ridership study. Air carrier data, in particular were updated, but a basic 1994 automobile ridership survey was not updated. Automobile riders are the source of about half of the ridership for the project. Equivalent, updated automobile ridership data should be applied in a thorough and consistent fashion to an analysis of all alignments. Furthermore, air carrier travel times have changed in the aftermath of the September 11, 2001 terrorist attacks, and should be adjusted to ensure accurate projections.

The 1996 and 2000 studies are the only basic background in the record on ridership modeling, so the public must take at face value a third set of ridership data: charts

published in the December 1999 Corridor Evaluation, which draw from 1999 runs presented to the HSRA board and acquired by PCL through a Public Records Act request. These runs show Altamont attracting 20.02 million riders in 2015, and Pacheco attracting 21.12 million.[3]

Several factors improperly skew the available modeling against an Altamont alignment and in favor of a Pacheco alignment:

(1) The Altamont ridership modeling assumes that half of all trains proceed north from Newark to San Francisco, and the other half proceed south to San Jose. This arbitrary 50/50 split is unlikely maximize overall ridership and other system benefits. The DEIR should present overall ridership, station alighting, origin/destination pair, and Phase I/Phase II data for an Altamont alignment, using the apportionment of trains between San Francisco and San Jose that produces the maximum system ridership.

(2) The computer model computes access to HSR stations is based only on highway travel times to stations. Separate DEIR/S parking studies conflict notably with this assumption. For example, the parking studies estimate that 25% of intercity passengers walk to the SF station (the busiest station) and 20% walk to the Oakland station; 30% of SF passengers are estimated to access HSR by a rail connection and only 20% arrive by private automobile. Clearly, some alignments and station locations provide significant opportunities for non-highway access to HSR. Particularly, ridership due to BART access to the Newark, Pleasanton and San Francisco stations along an Altamont alignment should be encoded as a basic part of the ridership model. Special consideration should be given to ensuring that a proposed Altamont alignment meshes physically and through operational coordination with BART and other major modes of station access.

(3) The DEIR/S errs by not considering feasible and preferable alternatives for serving Oakland. The DEIR/S does not consider that Oakland could be served either by direct BART connections in the Livermore Valley and at Fremont or by a shuttle train between Fremont and Oakland, thus not requiring that there be a three-way split of trains using the Altamont alternative. As part of the "BART" option for serving Oakland, "Express" BART service through new sidings should be modeled as a means of better serving Oakland without a direct HSR connection. Alternatively, a dedicated shuttle HSR train could operate non-stop between Fremont and Oakland, providing considerably faster travel time than BART over the same distance. Under this option, the shuttle train could operate straight through Fremont for all the Sacramento services, thus giving the best benefit of any HST service to Oakland. Further, shuttles could operate to provide connecting service to every eastbound and westbound train at Fremont. This would provide more HST service into Oakland than the service plan proposed by HSRA.

[3] The Corridor Evaluation's ridership data on the Altamont alignment is unclear about whether it includes service to both San Francisco and San Jose. On page III-30, Exhibit 3-35 shows Altamont ridership at 20.02 million riders. It implies that San Francisco and San Jose are served, since it shows travel times to each of these cities from the Central Valley. On page III-33, Exhibit 3-40 again shows Altamont ridership at 20.02 million, but it includes this footnote: "Alternatives from Newark to San Francisco or Oakland. Does not include Newark to San Jose."

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Indeed, HST service to Oakland would exceed that to either San Francisco or San Jose since it would meet all trains.

A further note on Oakland: the DEIR/S presents the need to serve Oakland as a key reason to reject the Altamont alignment. However, ridership modeling presented to the Board in May of 1999 as part of the Corridor Evaluation showed that, under a Pacheco alignment, building the Phase Two line to Oakland would actually cause total HSR system ridership to **decline.** This modeling projected that the Phase One alignment from LA to SF would attract 21.116 million riders. Adding a line to Oakland reduces overall system ridership to 21.100 million riders. (Ridership and Revenue Analysis for High Speed Ground Transportation in California: Task 3 Report on Forecasts for Northern California Route Options, Background Material for the California High Speed Rail Authority, May 19, 1999, Charles River Associates). Since it would be hard to justify spending hundreds of millions of dollars to build the Oakland line if it reduces overall ridership, this data brings into question how seriously the DEIR has considered the question of serving Oakland. Add to this the fact that many tables in the studies underlying the DEIR simply show no data for Oakland, and the need for a more complete analysis of service to Oakland is clear.

Service to Sacramento is another area where ridership modeling and other analyses is totally inadequate. The differences between alignments for Sacramento will be stark. As the DEIR/S notes:

> "An express train traveling between Sacramento and San Jose would take only 47 Minutes via the Altamont Pass, whereas it would take 1 hour 12 minutes via the Pacheco Pass. Between Sacramento and San Francisco, the Altamont Pass express time would be 59 min, whereas the same trip via the Pacheco Pass would require 1 hr and 40 min." DEIR/S at 2-38.

The time advantage for travel to and from Sacramento—41% faster for San Francisco and 35% faster for San Jose—results from Altamont's much shorter, more efficient route. For instance, it is 147 miles from San Francisco to Sacramento over the Altamont Pass, and 262 miles over the Pacheco Pass. This dramatic difference should yield specific, increased Sacramento-Bay Area ridership figures, which are nowhere in evidence in the DEIR/S or its supporting materials.

The DEIR/S's treatment of Sacramento-Bay Area travel also could be enhanced by further explanation of its estimate of competing Sacramento-Bay Area auto travel times. As a weighted average, the 2000 CRA study estimates that drivers will need 1 hour and 43 minutes (103 minutes, 2000 CRA page 50) to travel between Sacramento and San Francisco in 2015 (the same estimate applies to driving between San Francisco and Stockton). Of course, particularly business travelers returning from San Francisco to Sacramento in the evenings currently experience much longer trips and very uncertain travel times. Presumably, peak travel times already incorporated in the model for this market are longer, but it would be helpful to know how long peak-period drivers are estimated to need, versus HSR travel times, in this major market under different

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alignments. The combination of long, uncertain auto travel times at peak periods and swift train service may produce significant HSR ridership, which should vary considerably under different alignments.

Also, the ridership model assumes that certain freeways will be widened, making it easier to drive, particularly between northern Central Valley destinations. Less congested driving conditions due to the predicted freeway construction likely reduces predicted HSR ridership in this region. Particularly, the model assumes that in 2015, I-580 will be widened by one lane in each direction "between Stockton and Sacramento" (2000 CRA page B-3). Of course, I-580 does not lie between Stockton and Sacramento. But whether I-580 is widened east of Tracy, or whether I-5 is widened between Stockton and Sacramento, ridership on HSR from the Bay Area to Merced (and systemwide) is affected. A revised DEIR/S must specify what effect this assumed lane-widening has. Since the cost benefits of the system are estimated starting in 2016—one year after the assumed widening of I-580—the lane-widenings in 2015 essentially affect the cost/benefit of the HSR project from its inception (see below for more on cost-benefit). If they are not significant, then they are extraneous to the DEIR/S. If they are significant, policymakers should know how much HSR ridership would be reduced by freeway lane-widening, and how this lane-widening plays out under Pacheco and Altamont alignments.

Even though Sacramento will not be served until Phase II of the project is built, the relationship between travel times, distance and ridership highlights Sacramento's stake in a clear presentation of project phasing information. The extension needed to reach Sacramento in Phase II of the project under an Altamont alignment is much shorter and probably less expensive to build than under a Pacheco alignment. A revised DEIR/S should clearly present and compare how much it will cost to extend Phase II to Sacramento under the Altamont, Diablo, and Pacheco routes. Similarly, this analysis should compare the revenue available from the Phase I project (not simply the full build-out revenue), since this revenue is supposed to help finance the Phase II extension. The statewide project benefits claimed in the DEIR/S will never occur if Phase I is not strong enough in ridership and revenue to adequately help finance the extension to Sacramento and other Phase II cities.

HSRA staff public remarks have at times downplayed the importance of the Sacramento-Bay Area market because the HSR plan has been focused around longer distance travel markets—particularly LA-Bay Area trips. But this and other shorter-distance markets cannot be ignored, in part because they are so large. As the Charles Rivers studies point out the LA-SF market around which the proposed HSR system is designed is California's **third** largest intercity travel market, at 26.2 million trips in 2020 (12.5%). Sacramento-SF is the second largest market at 28.1 million trips, and LA-San Diego is first at 46.9 million trips.

Furthermore, the 2000 update of travel data from the 1996 study, which presumably is the basis for modeling in the DEIR/S, notes that

> The largest changes occur for the Sacramento-San Francisco market, consistent

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> with the fact that these cities show the largest upward revisions in projected real income…… The large jump of 13 percent in the Sacramento-San Francisco market results in nearly three million additional auto trips being forecast for this city pair." (CRA 2000, pp. 42-43)

The leading growth in this particular market argue, again, that detailed O/D trip tables and station alighting data showing what happens in the Bay Area Francisco-Sacramento market under Altamont and other alignments for Phase I and Phase II of the project are necessary before any alignment decision is made.

DEIR/S parking analysis, which draws on Business Plan (Pacheco alignment) ridership data reinforces the need for more transparency regarding the effect of different alignments on the Bay Area-Sacramento market (and the Sacramento-Southern California market). This analysis, intended to allow regional DIER/S teams to estimate parking needs at stations, provides some of the more detailed ridership-related data in the DEIR/S. It shows that, even under a Pacheco alignment, San Francisco is the busiest station in the system in terms of total daily boardings. LA is second, and Sacramento is third. San Jose is sixth, with boardings 15% below that of Sacramento. These estimates include separate studies of commuter ridership for select cities that account for 15% of daily boarding in San Francisco and San Jose, but include no estimate for commuters into Sacramento.[4]

The fact that the shorter-distance markets are dominated by auto travel has implications for air quality analysis in the DEIR/S. For instance, DEIR background documents allude to the fact that ridership on an Altamont Pass alignment will draw more riders from the northern Central Valley in Phase I of the project than the Pacheco alignment. Since air carrier service is almost non-existant in this market, these northern Central Valley riders are diverted from cars. This means that the air quality impacts of an Altamont alignment for at least the Phase I project will be different from those of a Phase I Pacheco alignment project, since a large share of the projected air quality benefits claimed for the in the DEIR/S come from reduced auto emissions. This is a particular issue in the San Joaquin Valley, where the DEIR/S claims that HSR delivers almost triple the air emission benefits of other regions. A revised DEIR/S must explore whether an Altamont alignment could deliver even more benefits, especially in the Central Valley and Sacramento areas, potentially decades sooner (i.e, when Phase I is constructed, not at the potentially distant Phase II).[5]

[4] This parking analysis suggests the potential benefits of carefully planning HSR connectivity to public transit, walking, and bicycling, and for smart growth around stations. For instance, the busiest station, San Francisco, requires less than 1/10th the parking of the East San Gabriel station, which has only about half of San Francisco's daily boardings. This difference is due to estimated pedestrian, rail, bus, and taxi access to the San Francisco station, rather than private vehicles needing parking.

[5] This analysis should incorporated scenarios for HSR freight service. Such service is briefly mentioned in the DEIR and dropped for purposes of analysis. More information is available in the 2000 Corridor Evaluation. To the degree that freight service could reduce truck traffic on parallel corridors, it represents an opportunity for traffic congestion reduction (a major factor in the DEIR/S's cost benefit analysis), reduced diesel emissions, and enhanced revenues.

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The DEIR/S's ridership analysis also underpins its cost-benefit analysis. The DEIR/S predicts that HSR will draw riders from primarily from auto and air modes, relieving congestion and producing value for drivers and air passengers not riding HSR. These "non-user benefits" (calculated directly from the ridership studies) are assigned a dollar value and provide far and away the largest financial justification for the project. Of $44 billion in total estimated project benefits, $25.7 are non-user benefits, $8.8 billion are user benefits, and $9.7 billion are in the form of passenger revenue ("Independent Ridership and Passenger Revenue Projections for High Speed Rail Alternatives in California, January 2000" page 102). The largest share of the non-user benefits derive from avoided accidents, time delays and air pollution related to attracting riders away from driving on highways: Under the Pacheco alignment presumably used for this study, Californians living near highways and using highways will breath cleaner air, avoid highway accidents, and experience reduced highway congestion worth an estimated $13.6 billion, as compared to approximately $12 billion in saved time for air travelers and aircraft operating delays due to reduced airport congestion (this despite the fact that the model assigns a much higher monetary value to the time of air passengers than drivers). An Altamont alignment would likely yield a different result and possibly greater overall non-user economic benefits. More importantly, these different economic benefits would reflect a different situation on the ground: possibly cleaner air, less traffic congestion, and fewer deaths and injuries on the road. Thus, a more complete display of results from existing modeling runs and new runs comparing the Altamont and Pacheco is needed not only to see which alignment maximizes "ridership and revenue," but also to explore the best decision economically for the state and in the daily lives of all Californians. As mentioned before, this analysis should separately consider Phase I of the project separately from the full Phase II project.

Ticket price is another key variable in the ridership modeling. One special emphasis of Charles Rivers Associates' work is that the general public might benefit if HSR is operated with somewhat lower fares than those that would provide maximum revenue (thus the DEIR/S's stated goal of maximizing "ridership and revenue potential" involves two related, but separate goals, highlighting the need for a complete record of data to reveal tradeoffs). For instance, the project can produce almost as much revenue by charging a little less in the Central Valley and carrying many more riders, as it can by charging more and carrying fewer passengers. As mentioned above, the non-passenger statewide benefits of traffic congestion reduction and fewer accidents associated with such a strategy could be significant—possibly far outweighing lost revenue. The flexibility for lower fares to gain ridership is particularly pertinent in the shorter-distance, non-endpoint markets such as Sacramento and Central Valley access to the Bay Area. Furthermore, this price variable should interact with alignment choice: Attracting more Central Valley riders through lower fares would likely be more effective under an alignment that serves more Central Valley cities in Phase I, such as the Altamont alignment. This is yet another reason why separate Phase I and Phase II analysis should be presented, including station and O/D-specific data, and preferably with two or more pricing options.

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Finally, the assumed catchment areas for ridership were assumed to be much wider in the Bay Area (all nine counties) than elsewhere, yet no evidence was provided to substantiate this claim. The HSR Screening Evaluation notes the catchment area for employees and population in the Year 2020 was assumed to be equal to the airport catchment area, rather than the 10 mile radius used elsewhere (Bay Area to Merced HSR Screening Evaluation, page 52). If a larger area is valid for the Bay Area, why not for the entire system? Furthermore, the catchment area for ridership—often a county—is broader than the catchment area for environmental impacts. If the project is going to gather drivers from a county-wide (or nine-county-wide, in the Bay Area) area, then arguably it will have environmental impacts over this full ridership catchment area.

Again, the DEIR/S identifies "maximizing ridership and revenue" as the first key criteria for deciding where to build HSR. But data to support this decision are insufficient, inconsistent, and inadequately displayed. Indeed, at times the DEIR/S seems to abandon ridership modeling and to use travel times over segments of alignments and segment lengths as a proxy for the needed analysis to "maximize ridership." A thorough display of ridership modeling data on each phase of the project under different alignment options, which includes the range of Altamont service options, could make the difference in serving millions of people for decades to come, and in enhancing cost-effectiveness by hundreds of millions of dollars, if not billions. New coding and new runs will be needed, but much of this work involves simply processing and presenting model outputs. This is basic work that is absolutely necessary before the environmental document can be certified as legally adequate and the state decides to build a multi-billion dollar project with a 100-year or more service life.

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Attachment C:

Flaws in the DEIR/EIS's Analysis of Biological Impacts

Overall, the Draft EIS/EIR lists the biological resources that could be affected, their general location, and general descriptions of their habitat associations. The technical documents give an overall tally of how much habitat for each species would be directly impacted within a narrow impact zone (between 1000ft and 0.5 mile depending on amount of current development) and report whether there is a low, medium, or high level of impact. However, the documents do not discuss the relative quality and importance of the habitat to be destroyed to the species overall survival. This failing and others render the DEIR/S inadequate for informing alignment decisions because alignment choices will sharply affect most, if not all, of the biological impacts listed below. Further analysis, as suggested below, is necessary prior to any alignment decision.

A. Inadequate Data/Information:

A major flaw in this already inadequate analysis is that the habitat and occurrence data used to develop the estimate of the impact are based on occurrences in the California Natural Diversity Database. These occurrences are not comprehensive and only cover areas that have been surveyed. Large amounts of unsurveyed land (often private lands) may have higher densities of species, but since no surveys have been conducted, the quality of this habitat is unknown. However, the DEIS/EIR would score this as low to zero habitat value. It is unacceptable to make decisions regarding the relative impact of the various route alternatives (and indeed impossible to identify the least environmentally damaging alternative) without on-the-ground data that reflect the real biological condition. Indeed, the draft document acknowledges that "the lack of identification of an impact does not necessarily mean that this portion of the proposed alternative would not result in potential impacts on biological resources, only that location-specific data would be required to make a more precise determination." (DEIS/R).

In addition, the DEIR/EIS relies on the National Wetlands Inventory to analyze impacts to wetlands. This database provides only a very coarse and incomplete analysis of wetlands in California. The database is compiled by aerial photographs of landscapes in which many smaller wetlands are not readily distinguishable. In addition, many areas in California have not been photographed. In order to ascertain a more complete picture of wetlands impacts, the environmental documents need to conduct a more thorough review of potential wetlands impacts, including on-the-ground surveying efforts.

B. Inadequate Analysis of General Impacts to Biological Resources:

Roads are one of the top causes of species imperilment in California (National Wildlife Federation 2001) and the impacts of railroads as linear transportation features are assumed to be similar. Specific ecological effects of roads have been thoroughly documented (Forman and Alexander 1998, Trombulak and Frissell 2000, Natural Resource Defense Council 1999). The key impacts are mortality from project